The Scientific Review,

AND

SCIENTIFIC AND LITERARY REVIEW,

A RECORD OF PROGRESS IN ARTS, INDUSTRY, AND MANUFACTURES,

INCORPORATING THE

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SUBJECT MATTER INDEX OF APPLICATIONS FOR PATENTS.

May 21st to June 20th inclusive.

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⁂ *The above List is prepared from the Patent Records by Mr. T. Morgan, Secretary of the Inventors' Patentright Association, Limited.*

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Reviews.

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A GRAMMAR OF JAPANESE ORNAMENT AND DESIGN.

"A Grammar of Japanese Ornament and Design." By T. W. CUTLER. Illustrated. Batsford.

THE author of this completion of a former instalment of this work is worthy of the congratulations of our contemporary the *Athenæum*; we therefore simply reproduce its notice thereon :—He has written an excellent prefatory essay, or rather group of essays, on the history and characteristics of Japanese ornament and decorative design. Of design, in the higher sense of the word, the Japanese have none. In this respect, more than in any other, the obvious and often suggested comparison between the art of the Japanese and the fine art of the feudal period in Europe fails. Satire, humour, wild caricature, beautiful if semi-conventional draughtsmanship of details, a mastery of the grotesque that borders on the stupendous, if not the horrible, are the highest elements in Japanese design.

As we have more than once remarked, the art of the Japanese consists in perfect skill in drawing details, or rather in seizing with intuitive felicity the peculiarities of the forms, textures, attitudes, and local colours of the inferior animal and entire vegetable creations, in a noble sense of the mechanics of water movements, and magical power in foreshortening by hand, while not the slightest glimpse of linear or aërial perspective has been obtained. Of a feeling for human beauty, more especially for its intellectual and psychical manifestations, no one has yet seen the signs in any oriental phase of art. It would be too much to deny to the Japanese, or even to the Chinese, Indians, or Persians—under which four great divisions we group all oriental art-craftsmanship—the possession of power to delineate the human figure, to carve it or to paint it in a manner worthy of their ability to deal with almost every other subject of design. Other races, in what, for convenience sake, may be called the feudal stages of their history, have shown a similar indifference to the noblest, the most difficult application of formative art. Europeans of the Middle Ages were the sole exception to this rule. With very few exceptions, we know of no Japanese illustration of the pathos and dignity of landscape, or even of the parts thereof, such as trees, water, rocks, cloud-shadows, sunlight. With this people landscape painting, like the painting of the human figure, is not a mode of expression. What is often said of Mr. Ruskin's curriculum of art-training is undoubtedly true of that of the Slade Professors of Japan. It is all in favour of their pupils that an inheritance of centuries of training seems to have developed what it would not be unfair to call the sense of draughtsmanship. Their teacher being the same, a Japanese lad will, with amazing ease and felicity, draw those copies which weary his British schoolfellow, and often completely baffle a German boy. Greater power of observing, comparing, and analysing the subjects they affect in common seems to belong to the Japanese than to the Chinese; no other people can be compared with either. To this excellence is due that unreasonably large share of praise which has been awarded to the art-craftsmanship of these nations by admirers whose zeal outruns their discretion. But these things are only the modes of expression—the technique of decorative design or draughtsmanship proper—and possess a limited application.

NOTE BOOK OF AN AMATEUR GEOLOGIST.

"Note Book of an Amateur Geologist." By JOHN EDWARD LEE, F.G.S., F.S.A. London: Longmans, Green, and Co. 1881.

THIS interesting work is in part the results of the author's wanderings, which, from the dates on the plates, extend over a period of half a century, and include descriptions and illustrations on geological matters sketched on the spot in England, Wales, Scotland, Germany, France, Switzerland, and Italy. We trust the success this work should receive will encourage the author to publish his archæological sketches. We cordially recommend the work to Geologists, and as the author styles himself Amateur Geologist it will be equally useful to that class also.

A DICTIONARY OF CHEMISTRY.

"A Dictionary of Chemistry and the Allied Branches of Other Sciences." By HENRY WATTS, B.A., F.R.S., F.C.S., Editor of the *Journal of the Chemical Society*. Third supplement, Part 2. London: Longmans, Green, and Co. 1881.

THIS bulky volume forms the second and concluding part of the eighth vol. of this well known and much appreciated dictionary, bringing the record of chemical discovery down to the end of 1878, and including the more important discoveries which have appeared in 1879 and 1880.

The author acknowledges the assistance of Prof. Armstrong, F.R.S.,, James T. Brown, F.C.S., Walter Flight, Ph.D., Prof. G. C. Foster, B.A, F.R.S., G. F. Rodwell, F.C.S., Arthur Schuster Ph.D., F.R.S., Prof. Thorpe, Ph.D., F R.S., R. Warington, F.C.S.

FUSION OF METALS BY ELECTRICITY.—M. Imbert describes Siemens's method of fusing large metallic masses by means of electricity. He uses a plumbago crucible, surrounded by a thick refractory wall, the cover being traversed by a carbon rod of 20 millimeters (0·79 inch) diameter. This rod is suspended by one of the arms of a balance beam, the other arm carrying a cylinder of soft iron sliding freely in a solenoid and plunging into a liquid, in order to moderate the oscillations which might arise from sudden variations of current. In one experiment 500 grammes (1·102 pounds) were melted into a compact ingot in four and one-half minutes. In melting large quantities the electrical method is rather more than twice as costly as the ordinary furnace, but for the fusion of precious or refractory metals, for chemical purposes, and for other applications where the question of economy is secondary, the new method is very convenient and practical. In melting small quantities it may even prove economical.—*Ann. du Gen. Liv.*

AMERICAN SOCIETY OF CIVIL ENGINEERS.

The thirteenth annual convention of the American Society of Civil Engineers began in Montreal, June 15. Arrangements were made to have such of the members as desired to do so to meet at Niagara Falls, on Saturday, June 11, to examine the new suspended structure of the railroad suspension bridge and the reinforcement of its anchorage. A paper on this subject was presented at the convention by L. L. Buck, Member A.S.C.E., the engineer in charge of the work.

After spending Sunday at Niagara the party proceeded to Toronto, and after a short stay at that city, went to Montreal by a steamer, on Lake Ontario, passing on Tuesday the Thousand Islands and the Rapids of the St. Lawrence, and arriving at Montreal the evening before the day of the opening of the convention.

The following papers were announced for presentation during the convention: "Reinforcement of the Anchorage and Renewal of the Suspended Structure of the Niagara Railroad Suspension Bridge," L. L. Buck; "The Stability of Tunnels in River Silt," Ashbel Welch; "Repairs of Masonry," O. Chanute; "Experiments upon Strength of Wrought Iron Columns," T. C. Clarke; "On Weights and Measures," Charles Latimer; "Comparative Economy of Light and Heavy Rails," Ashbel Welch.

AMERICAN INSTITUTE OF MINING ENGINEERS.

The American Institute of Mining Engineers met at Staunton, Va., May 30. The members present included President William Metcalf, of Pittsburg, Penn.; Dr. R. W. Raymond, of the School of Mines, Columbia College, New York: Dr. Thomas Egleston, of the School of Mines, New York; Dr. Dudley, chemist of the Pennsylvania Railroad Company; Professor P. Frazer, of Philadelphia; Dr. T. Sterry Hunt, of Montreal; J. A. and J. T. Burton, of Troy, N.Y.; W. P. Ward, of Savannah, Ga.; and F. S. Withebee, of New York.

In his annual address President Metcalf spoke of the advance of science and its results, and of the education of engineers. Special stress was laid upon the continuous study of the higher mathematics and practical observation as means of self education and professional success. A paper by J. H. Mackintosh, on "The Electrolytic Determination of Copper," was read by Professor Egleston, and discussed by several members. Dr. Frazer read a paper on "The New Geological Map of Chester Co., Pa."

The opening paper on the second day was by Professor Egleston on "The Ore-Knob Copper Process," employed at the mines of the Ore-Knob Copper Company in North Carolina. The belief was expressed that a great amount of copper lay dormant in the South, which, if properly worked, would be as profitable as the lake copper. Major Hotchkiss, of Virginia, thanked Professor Egleston for drawing attention to the copper deposits of the South. Very few persons are aware of the great wealth in this mineral with which this State abounds. Forty years ago Richard Taylor made explorations and reported on this class of ore. The only difficulty in its development then was the lack of transportation facilities. That objection does not now exist, and this industry may be expected to be seen coming prominently to the front.

A paper prepared by F. H. Williams, of St. Louis, Mo., on "A Volumetric Method of Estimating Manganese in Pig Iron and Steel," was read by the secretary. It was an adaptation of the known processes. In connection with it was presented a paper on "Manganese Determinations in Steel," prepared by William Kent, of Pittsburg, Pa. These papers were discussed by Drs. Drown, Sharpless, and Dudley. In reference to the subject of steel rails letters were read from Richard Akerman, of Stockholm, Sweden, and C. P. Landberg, of London, England. The latter showed a preference for the mechanical over the chemical tests of steel rails, though he recognised the full importance of both. Considerable discussion ensued upon this subject, the principle participants being Drs. Raymond and Dudley.

At the afternoon session Dr. Sharpless, of Boston, made a statement with reference to the blackband iron ores of West Virginia. F. P. Dewey, of Tennessee, read a paper on "Rich Hill Iron Ores." O. J. Heinerich, of Drifton, Pa., explained the practical working of the ammonia soda process, and Stuart M. Buck, of Virginia, read a paper "On the Hard Splint Coal of the Kanawha." After an explanation of the geology of the valley by Major Hotchkiss, the Institute adjourned.

At the night session Professor Frazer, of Philadelphia, read a paper on "Observations on some of the Ores of the Upper James River." This was followed by Major Hotchkiss in a description of the topography and geology of the Virginia Valley.

The programme for June 1 was devoted to an excursion over the Shenandoah Valley road to the Luray Cavern, with an examination of the rich mineral deposits of the valley.

ENGERT'S INVENTION.

THE following important communications on Mr. Engert's Invention will afford much satisfactory information as to his valuable invention.

Science and Art Department, London, S.W.
March 1, 1881.

SIR,—With reference to your letters of the 2nd, 14th, and 23rd ult., I am directed to inform you that the apparatus placed by you in the Chemical Lecture Theatre, at the Science Schools, South Kensington, is found to remedy the acoustic defects of the room to a very considerable extent. The Department regrets that it has been impossible for you to apply your invention in its entirety, as you could not be permitted to touch the wall behind the lecturer's table. —I am, Sir, your obedient servant,

NORMAN MACLEOD.

Mr. A. C. Engert,
Three Mills Lane,
Bromley-by-Bow, E.

Dr. Frankland's Theatre, in the Science and Art Department, South Kensington Museum, was in a most pitiful acoustic condition before the application of my Apparatus, the walls being hung from top to bottom with double worsted curtains, and a great number of strings or twine drawn across the Theatre from side to side, for the purpose of subduing the long and loud after-sound (or echo), so very destructive to speech and music. But, with all these contrivances, the words of the Lecturer were even then heard indistinctly by the audience, so much so that chairs were placed quite close to the lecture-table to enable the lecture to be heard. Now, all these curtains, strings, and chairs are removed, as my patent apparatus for the improvement and distribution of sound has remedied all the acoustic defects. Every syllable properly articulated by the lecturer is clearly heard over the whole theatre, even though the place be quite empty: and this great alteration has been achieved by only the partial introduction of my invention, as expressed in the official certificate above.

Dr. Frankland, writing to the inventor, says that after the apparatus was fixed :—

"Even when there is no audience in the theatre a speaker behind the lecture-table can be fairly well heard on the benches furthest removed from him.

"E. FRANKLAND.

"Jan. 31st, 1881."

This, then, I think, will prove the efficiency of the invention, and show what a great benefit the public may experience in their churches, chapels, council-rooms, lecture- and concert-halls, by the application of my patent apparatus for the improvement and distribution of sound.

A. C. ENGERT.

THE PRODUCTION OF PARAFFIN AND PARAFFIN OILS.

By R. HENRY BRUNTON, M. Inst. C.E.

THE discovery of paraffin wax, about 1830, was as the author of this paper (read at the last meeting of the Institution of Civil Engineers) stated, generally ascribed to Reichenbach, a German chemist; but, nearly at the same time, Dr. Christison, of Edinburgh, obtained a small portion of that substance from Rangoon mineral oil. The credit of producing this wax in merchantable quantities belonged however to Dr. James Young, of Kelly, in Renfrewshire. In 1848, Dr. Lyon Playfair directed Mr. Young's attention to an oozing of petroleum through a coal working at Alfreton, in Derbyshire. Mr. Young made arrangements to operate on this, and obtained a notable quantity of wax, as well as a light oil for burning and a heavy oil for lubricating purposes. After two years' successful working, the supply of petroleum at Alfreton ceased. Mr. Young then, as the result of numerous and protracted experiments, succeeded in obtaining, by the application of gentle heat to coal in close vessels, an oleaginous liquid similar in character to petroleum. Prior to this period (1848-9), the distillation of coal was conducted at high temperatures for the production of gas, Mr. Young being the first to attempt it with the ostensible object of obtaining liquid products. The process, the main feature of which was the gradual and gentle application of heat, was patented in 1850, and the patent was successfully maintained, notwithstanding numerous attacks.

About the same time the Boghead or Torbanehill mineral was discovered, from which Mr. Young obtained 120 to 130 gallons of oil per ton. It was worked out in 1862, and paraffin oil had since been derived from the bituminous shales existent in the Coal Measures. From 80 to 90 per cent. of that now worked was found in the counties of Linlithgow and Midlothian, and large fields were believed still to exist. The yield of oil from shale was only about one-fourth that from the Boghead mineral, yet the Companies engaged in the trade were in a fair state of prosperity. There were eighteen establishments in Scotland for the manufacture of paraffin oil, using 1,036,000 tons of shale per annum, and producing 34 million gallons of oil. From this there were generally obtained, by the processes of rectification, 6 per cent, of naphtha, 35 per cent. of burning oils, 14 per cent, of lubricating oils, and 9 per cent. of solid paraffin, the remaining 36 per cent. being lost. The lightest portion of the naphtha, known as "Gasoline," was employed for carburetting air for illumination of country houses, etc. : other portions were used for burning in open-air lamps and for dissolving caoutchouc; while the heavy portion was applied for dissolving paraffin scale in the process of refining it. "Burning oils" were sometimes divided into lighthouse-oil, which was of the greatest illuminating power and was the safest. No. 1 burning-oil; crystal-oil, which was No. 1 oil after treatment with acid and soda for removing its colouring matter and odour; No. 2 oil, and marine-oil; but these varieties were generally mixed together and sold under various appellation:

By the Petroleum Act of 1871, the flashing point, or temperature at which mineral oils should give off an inflammable vapour, was fixed as not under 100° Fahrenheit. This point was decided by the "open" test, but the results obtained by its means were variable and incorrect. By the Act of 1879, the test was made a "close" one, the apparatus designed by Professor Abel being employed; the "flashing point" corresponding to 100° Fahrenheit, as made by the old test, being fixed at 73° by the "close" test.

The value of mineral oils as illuminants varied considerably. Lighthouse-oil had been the subject of extended experiments; and, whereas, when this was first used, a great advantage was apparent, both in consumption and illuminating effect, over vegetable oils, recent improvements in lamps made by Mr. James N. Douglass, M. Inst. C.E., and others, seemed to have diminished if not altogether to have destroyed, this superiority. But it was reasonable to suppose, owing to the larger proportion of carbon in mineral oil, that it should give better results, if consumed to the greatest advantage; and, in consequence, the inference was that the lamps, at present in use, were not perfect in this respect.

The lubricating mineral oils had the defect of being deficient in body. The viscosity of an oil was tested by measuring the time a certain quantity took to pass through a tube, and by comparing this with rape oil as a standard. This being represented as 1,000, mineral oils had a viscosity of from 250 to 400. They were therefore mixed with vegetable oils in certain proportions, and an addition of from 20 to 30 per cent. was said to improve their lubricating properties.

Paraffin wax was of varied fusibility; that of a low melting point was used in the manufacture of matches, and that having a higher melting point chiefly for candles. Paraffin candles, which were made with a slight admixture of stearine, gave a clear smokeless flame, and a considerably superior light to sperm candles. It was claimed for paraffin that it was pure olefiant gas in a solid form, was converted into this gas when exposed to heat, and consumed without giving off any impurities.

The manufacturing processes for conducting the distillation of shale, introduced by Mr. Henderson, of the Broxburn Oil Works, Linlithgowshire, had led to the production of an oil of 1d, per gallon greater value, with an increased yield of ammonia, and at a saving of 1s. 6d. per ton, in fuel and maintenance of plant, on the shale dealt with. Mr. Henderson's retorts were placed in an oven above the combustion chamber, and were not in direct contact with the fire. The carbon remaining in the spent shale was utilized, this being consumed as fuel for the retort, and by its slow combustion an equable temperature of about 800° Fahrenheit was maintained. In the old form of retort the fuel used was coal, and the difficulty of maintaining a moderate temperature was so great that temperatures ranging from 1200° to 1500° were sometimes reached. The vapours from the retorts were led through a series of pipes, and partially condensed. The uncondensed portions were, in some cases, further subjected to condensation by pressure, or by a scrubbing process in a coke tower. The gas, still remaining uncondensed, was used as fuel. The ammoniacal liquor, which separated from the crude oil, was placed in boiler stills, and the steam blown through sulphuric acid for the production of sulphate of ammonia. By arresting the process before the formation of crystals in the "cracker" box, and allowing some time for the precipitation of the arsenic and iron, and afterwards effecting the crystallization by means of the evaporation of the liquid, an excellent commercial salt was produced from sulphuric acid, made from pyrites. The first step in the treatment of the crude oil was its distillation to dryness, when pure vesicular coke was left in the bottom of the stills. The oil was then subjected to an acid and alkali treatment, and was fractionally distilled, being divided into naphtha burning-oil, and a heavy oil containing 30 per cent. of paraffin scale. The burning-oil portion received another acid and alkali treatment, and was again fractionally distilled, when more naphtha was separated, as well as a heavy oil containing 10 per cent. of a more fusible paraffin. The burning-oil then received a final treatment, and on distillation was divided into the different qualities, already mentioned.

Naphtha was rectified by distillation and treatment, it being also separated into the different gravities required by consumers. The heavy oil, from the first stage of purification, was run into bags, which were squeezed in hydraulic presses, and in this way a portion of the scale was separated. The oil, so squeezed out, as also the heavy oil from the second stage of purification, was cooled by being put over a drum refrigerated by ether-machines, to 18° or 20° Farhrenheit and was again squeezed, when more scale was obtained. Different methods were adopted, both for the separation of the scale from the cooled oil, and for lowering it to the necessary temperature.

The paraffin scale was refined by being dissolved on three occasions in naphtha, again crystallized by cooling, and squeezed under hydraulic pressure. Its deodorization was effected by blowing steam through it, when in a melted state, for sixty hours; it was then agitated with animal charcoal, and was run through a paper filter into suitable moulds. The oil, pressed from the paraffin scale, received certain chemical treatments and was fractionally distilled, being separated into the required gravities; the light portion being returned as burning-oil, and the remainder becoming lubricating-oil, of 865, 875, 885, and 890 gravities. Any paraffin scale which these might contain was further separated by being refrigerated and pressed as already described.

The tar from the acid treatments was heated in large tanks to about 150° to 200° Fahrenheit, and the dilute acid and oil in it set free. It was then consumed as fuel, either in the furnaces of the boiler-stills, or with the object of evaporating dirty water. The soda contained in the tar from the alkali treatments was recovered by a process devised by Mr. Galletly, a chemist in the employment of Young's Company at Addiewell; 50 per cent. of the soda used being so recovered at a cost of about 3s. per cwt.

Owing to the demand for paraffin oils being principally in winter, large storage accommodation was necessary for the summer production. This was afforded by malleable iron tanks of 50,000 to 10,000 gallons each, as the oil only slightly affected that metal, while it had a rapid action on lead or zinc.

The Paper only professed to describe the mechanical means employed in the manufacture, and no attempt was made to explain the chemical principles involved.

RECENT AMERICAN AND FOREIGN INVENTIONS.

A Novel Lock Case, designed to meet the requirements of that type of indicator padlock in which the bolt mechanism and indicator mechanism are arranged in different planes, with a supporting plate between the same, has been patented by Mr. Frank W. Mix, of Terryville, Conn. The object sought is to combine economy in the manufacture of the case with intrinsic merit in its structure, the principal points aimed at being the largest amount of room for the indicator mechanism in the smallest compass of case, and such a structure of a three-part case as will avoid strain on the rivets.

A Holder for Sashes of a window at any desired adjustment, and locking them when closed, has been patented by Mr. Edwin L. Barber, of Larwill, Ind. The invention covers certain peculiar features of improvement upon that form of sash holder in which a bar is attached to the horizontal upper portion of the stationary window frame and depends to the upper edge of the bottom sash, each sash being provided with an attachment to the rod, which permit the sashes to be adjusted up or down upon the rod to open or close the window.

An improvement in the class of *table frame* whose rails and legs are connected by metal clamps having flanges that enter a groove in the legs, has been patented by Mr. James Pleukharp, of Columbus, Ohio. The improvement consists in providing the legs with vertical grooves which are inclined transversely toward each other, and the rails with grooves that incline towards the legs, and in locking the legs and rails together by means of metal clamps having flanges that enter the grooves.

An Improved Tire Setter has been patented by Mr. Frederic P. Beucler, of Charleston, Iowa. The object of this invention is to facilitate the setting of wagon and other tires, and the adjustment of felly and spokes. It consists of a revolving swinging head carrying a central ring, which is provided with pivoted radial arms than can be retracted or extended to suit wheels of varying diameters, and is vertically pivoted in a block rocked on a vertically adjustable standard by levers from a horizontal to a vertical plane and *vice versa*, whereby a wheel on the machine may by plunged into and withdrawn from a water tank.

An Improved Oiler has been patented by Mr. Alexander McMullen, of Ottumwa, Iowa. The object of this invention is to facilitate the oiling of pulley bearings, journal bearings, and other wearing surfaces, regulate the amount of oil applied, and prevent the escape of oil when not required.

Mr. William S. Bright, of Letart, West Va, has patented a *stalled stock car*, whose stalls can readily be enlarged or reduced in size to accommodate the largest number of animals, and the car is fitted so that the animals can be conveniently supplied with water.

An improved furnace for *ventilating mines* has been patented by Mr. John R. McBroome, of Woodville, Pa. This invention consists in a furnace of novel construction, placed in an arched passage within the mine, so that the furnace arch is surrounded at top and sides by an air space. The furnace arch and air space enter a vertical ventilating shaft at one point.

Mr. James Smith, of Philadelphia, Pa., has patented an improved apparatus for *elevating bricks and mortar in hods*. It consists in features of construction for rendering the operation more perfect, and in a safety stop for preventing the hods from being carried over the upper wheels.

An *improved watch-case spring* has been patented by Mr. Joseph Canne, of Newport, Ky. The object of this invention is to provide a more durable watch-case spring, the spring part of which can be replaced, when broken, without renewing the body. This invention consists in forming the spring of sheet steel, having the thinner part toward the head instead of toward or near the body, as in other watch-case springs, so as to have the head on the most elastic part of the spring, and in lapping over the head instead of forging it, and in cutting away the lower edge of the spring portion for the purpose of increasing the elasticity of the spring and diminishing its stiffness. By using sheet steel for the spring no forging is required, and the strength of the spring is not impaired and by having the thinnest or most elastic part the head is not so likely to stay back as is the case with other springs.

An Improved Mower and Reaper has been patented by Mr. Milan D. Farnam, of Ira Hill, N. Y. The invention consists in the peculiar construction of the mechanism for connecting the cutter bar and shoe, and also for connecting the pitman with the shoe and the cutter bar; also in the combination with the various bearings of mechanism for taking up the wear; and in the combination with the brace or coupling of a mechanism for holding the brace bar and the shoe at the desired distance from the ground.

An Improved Cultivator has been patented by Mr. Lafayette K. Tipton, of Maysville, Mo. The object of this invention is to furnish a cultivator so constructed that it can be readily adjusted to work deeper or shallower in the ground, that the points of draught attachment can be adjusted directly in front of the centres of resistance, and that the mechanism will not be broken should the ploughs strike obstructions.

A Bean Pod Stringer has been patented by John L. Scharff, of Womelsdorf, Pa., removes the string or threads from bean pods, cutting off the ends of the pods. It consists in three bars, forming a clamp, clamping screw, a block or blocks having a semicircular flange, and a curved knife for removing the strings from the pods.

Surgical Apparatus.—Mr. Charles R. Gorgas, of Wooster, Ohio, has patented an apparatus that may be readily used by the surgeon without assistance, and in the case of fractures dispenses with bandages. The invention consists in a frame provided with an extension slide that is fitted for operation by a rack and pinion, so that the power required may be readily applied.

Spoons and Forks.—An improvement in spoons and forks has been patented by Mr. Norman S. Boardman, of East Haddam, Conn. The invention consists in combining with the bowl of a spoon or tines of a fork a brass wire and glass tip. The wire is soldered to the bowl at one end, and provided at the other with a glass tip cast on.

An Improved Steam Chest for hot-air drying, patented by Alexander Winward, of Accrington, county of Lancaster, England, consists in a sheet of tubes provided with cross pipes as well as inlet and outlet pipes. These tubes may be separate for the greater portion of their length and connected to each other at either end, the tubes opening at each end into a cross pipe or steam way, in such a manner that the steam may pass through them all; or the outsides of the tubes may be joined to each other by a central web extending the whole of their length.

An Improved Self-chalking Holder for chalk lines which chalks the line perfectly, and does not waste or break the chalk, has been patented by Mr. Chauncy Wing, of Greenfield, Mass. The invention consists in a tubular roller or barrel, upon which the string or line is wound, the barrel being provided with two loose end pieces united by a spindle, upon which a cylindrical piece of chalk is loosely mounted and pressed against and into one end of the end pieces by an adjustable spring in such a manner that the end surface of the piece of chalk is pressed against the string or line, which passes through a recess formed by the end surface of the piece of chalk, and a laterally projecting flange of the corresponding end piece.

A Machine for Rolling Axles, Rivets, Bolts, and other Articles, has been patented by Mr. John H. Whitney, of New York city. The metal is fed into the machine through a suitable guide consisting of a loose flanged short tube held between two or more rollers or adjustable slides, the metal being held between the rollers by a pair of automatic tongs, which close as the work progresses.

Improved Hoisting Apparatus has been patented by Mr. John George Speidel, of Reading, Pa. The object of this invention is to provide for lifting variable loads, to insure safety, and to compass those objects by an apparatus of a portable nature. The invention consists in a block provided with differential gearing of novel arrangement, in safety-stop devices and automatic brake mechanism, acting by weight of load.

The Scientific Review

AND

SCIENTIFIC AND LITERARY REVIEW,

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SESSION 1880—1881.

The Institute being out of Session, further meetings will not be held till next Session, commencing in November.

Subscriptions are payable to Mr. G. A. Stretton, the Receiver, 4, St. Martin's-place, S.W., who is the proper official to give receipts.

F. W. Campin, Sec.

Monthly Notices.

A German University in the United States seems to be taking shape. The sum asked, however, is two millions of dollars, and the *Athenæum*, from which we quote, remarks, "It remains to be seen whether the Germans settled in America have so strong a desire to give their sons a 'heimathliche Bildung' that they will subscribe this sum.

In Constantinople a Literary and Scientific Journal has been authorised, under the title of *Khazine-i-Evrak* (Treasurer of Documents), which will appear weekly. Its supporters include Munif Pasha, Sami Pasha, and other known writers.

Electric Lighting in Collieries.—Profs. Tyndall, Warington Smyth, and Abel, members of the Commission on Accidents in Mines, have been making experiments with Swan's electric lamp in Pleasby Colliery, near Mansfield. Ninety-four lamps, enclosed in safety lanterns, were used, and the results were considered satisfactory and may be regarded as an important step in the progress of electric lighting.

A Professor of Applied Mathematics.—The Council of Owens College at their last meeting elected Mr. Arthur Schuster, F.R.S., to the newly instituted Professorship of Applied Mathematics in the college.

The Decease of Sir Josiah Mason, who paid for the building and and endowed the Scientific College in Birmingham, which was opened in October last, took place at Erdington, on the 16th inst., in the 86th year of his age.

Simple Method of Determining the Temporary Hardness of Water.—In order to ascertain the alkalinity of springs on the spot, with samples not exceeding 10 c.c., and with a single reagent, V. Wartha makes use of a tube of 30 to 40 c.m. long, closed at the bottom, and with a mark showing the capacity of 10 c.c. From this mark upwards the tube is graduated into 0·1 c.c. To determine the temporary hardness the tube is filled to the lowest mark with the water in question, and a little piece of filter-paper, which has been previously steeped in extract of logwood and dried, is thrown in, thus giving the water a violet colour. Centinormal hydrochloric acid is then added from a dropping bottle, till the colour of the liquid inclines to an orange. The tube is then closed with the thumb and well shaken. The greater part of the carbonic acid escapes, and the liquid becomes red again. Acid is again added, and the shaking repeated until the next drop of the acid turns the liquid to a pure lemon-yellow, a point which by a little practice is easily reached. The amount of acid used is read off on the tube itself. The author proposes to express the alkalinity of a water by the number of c.c. of centinormal acid needed to neutralise 10 c.c. He thinks that this method will be found useful both for sanitary and geological purposes.

An Industrial and Technological Museum.—An Industrial and Technological Museum of a very comprehensive character is in course of organisation at Sydney. It is to include animal, vegetable, and mineral produce in the crude and in the manufactured states; waste products, of whatsoever origin; foods with their constituents, and that necessary shadow side of the picture, their adulterations; educational appliances; sanitary apparatus and systems, models, plans, machinery, &c., for mining; agricultural machinery and manures; models, drawings, and descriptions of patents; a department of economic entomology; ethnological specimens, &c. One remark in the prospectus may call up a smile. The museum is intended to occupy a similar position to the South Kensington Museum. This might be construed to mean that it is to occupy a site as far out of the way of merchants, manufacturers, patentees, &c., as possible.

Action of Light upon Phosphorescent Bodies.—M. Clémandot maintains that phosphorescence is a purely physical phenomena, due to a vibratory action exercised chiefly by the blue ray of light. He connects these phenomena of vibration in phosphorescent bodies with those which light occasions in organised bodies.

Influence of the Access of Oxygen upon Fermentation.—M. Meyer finds that free oxygen has no perceptible direct influence upon fermentation. He observes that under circumstances not yet perfectly determined, organic acids and their salts have a very remarkable influence upon fermentation.

THE SCIENTIFIC REVIEW
AND
Scientific and Literary Review
INCORPORATING THE "JOURNAL OF THE INVENTORS' INSTITUTE."

JULY, 1881.

INVENTORS' INSTITUTE.

The Annual General Meeting of the Inventors' Institute took place at 4, St. Martin's Place, Trafalgar Square, on Thursday, 26th May, at 4.15 p.m. J. Greenfield, Esq., was voted to the Chair, and took the same accordingly. Amongst those present were:—J. P. Cutts, Esq., T. Morgan, Esq., Messrs. F. H. Varley, Hillier, and F. W. Campin (Secretary), and other well known members of the Institute. Mr. G. A. Stretton, Acting-Treasurer, also attended the meeting.

The Minutes of the last Annual General Meeting having been read by the Secretary were passed as correctly entered.

The Chairman then requested the Secretary, Mr. F. W. Campin, to read the Report of the Executive Council, which was as follows:

Eighteenth Annual Report.

In presenting this the 18th Annual Report, the great difficulty that arises is the bareness of the field of utility that can be presented to the Members of the Institute. For the Government has done nothing to advance the claims of the Inventor, and up to the present time they remain in the same state as heretofore, although Mr. Anderson, M.P., for Glasgow, has again brought forward his Bill for amending the Patent Laws, which proposes to enlarge the term of Letters Patent from 14 to 21 years, requires the appointment of permanent Commissioners, and reduces the cost to a considerable extent, that is to say, the existing stamp duties are to be replaced by the following, viz., stamp on petition for Letters Patent 10s., and on certificate of notice to proceed 10s., &c.

This Bill, though it aims only at an instalment of reform, viz., reduction of cost (the requirement of permanent commissioners and extension of time being the only clauses outside of cost), and does not in any way reverse the present system, either in regard to granting of Patents or in reference to rendering the grant more secure and protective, is nevertheless, a step in the right direction. It has been estimated as such by the Executive Council, and looking at the difficulty of obtaining any common agreement on the details of a good Patent Law, many persons whose opinions are worth consideration have suggested that such a Bill might be an acceptable settlement of the Patent question for the present time. With the name of Mr. Anderson the names of J. H. Palmer, H. Broadhurst, and A. H. Brown appear as endorsers of the Bill, and Mr. Broadhurst we ought to mention has given the executive Council much assistance in regard to this matter.

Of course one cannot speak with certainty even with regard to Mr. Anderson's efforts, as for the present everything Parliamentary is in a peculiar state, but it may with some confidence be suggested that if the Inventors' Institute should think it desirable to aid Mr. Anderson in promoting this Bill, he will readily accept its aid, especially as the working men's organisations favour the Bill.

Although the Patent Laws have absorbed the attention of the Executive Council to a considerable extent, the other objects for which the Institute was established have not been neglected, but owing to the very inclement weather that has prevailed during the last session, it has been almost impossible to get up good evening meetings; still several papers of importance have been read at well attended meetings, and discussions had thereon.

The Executive Council propose that the thanks of the Institute in General Meeting assembled be given to all the readers of the papers above referred to, as also to the inventors concerned therein.

The Patent Law question has been discussed at several meetings. As regards the finances, the Executive Council have to state that a balance-sheet has been prepared, and audited by J. P. Cutts, Esq., auditor, and is submitted to the present meeting.

In conclusion the Executive Council may observe that they have now adverted to every matter proper to be brought before the general body of the members, and it therefore only remains to state that, according to the rules, one-third of the Executive Council have to-day to retire from office, but are eligible for re-election.

The list of members of the Executive Council having however by death, &c., been greatly reduced, the necessary selection of names has become so difficult that the Executive Council recommend election *en bloc*.

The Report having been read, the Chairman moved, and Mr. Cutts seconded, and it was resolved unanimously, that it be received and adopted and annexed to the Minutes of the Meeting.

The Acting-Treasurer, Mr. G. A. Stretton, then produced and read the balance-sheet—No. 1, receipts and disbursements; No. 2, assets and liabilities, audited by J. P. Cutts, Esq., the auditor of the Institute; and, on the motion of the Chairman, seconded by Mr. Morgan, the balance-sheet was passed and adopted unanimously.

The Secretary then adverted to the fact that at a recent meeting the Presidentship and Vice-Presidentship, as per published lists, were rendered permanent; hence no re-election of those officers was necessary; but it was open to any member to propose any addition to the list. The Chairman then moved, and Mr. Campin seconded, that the present President and Vice-President stand re-elected, if re-election be found necessary The General Council list was then read over by the Secretary, and the whole of the gentlemen on the list were, on the motion of the Chairman, seconded by Mr. Campin, unanimously re-elected, subject to such additions being made at an adjourned General Meeting as should be called for the purpose.

It was resolved, on the motion of the Chairman, seconded by Mr. F. W. Campin, that the whole of the members of the Executive Council be re-elected.

It was moved by the Chairman, and seconded by Mr. Cutts, that Mr. F. W. Campin be re-elected Secretary. This resolution was supported by the Chairman, who desired to add an expression of opinion on behalf of the members of the Institute of the advantage gained by its retaining the services of a gentleman so earnest in the cause of Patent Law reform, and so well qualified to advise the Institute on the legal questions involved therein.

It was moved by the Chairman, and seconded by Mr. Campin, and carried unanimously, that Mr. J. P. Cutts be elected the Auditor of the Institute.

It was stated by the Chairman, that the rules as now in effect would not require Executive Council meetings to be held during the months of July, August, or September, unless specially required.

The usual votes of thanks to the President, Sir Antonio Brady, Vice-Presidents, Executive and General Councils, the Secretary, and the Auditor, also a special vote of thanks to the Chairman of the day, J Greenfield, Esq. closed the proceedings.

Proceedings of Societies.

ROYAL SOCIETY.

April 28.—The President in the chair.—The following papers were read :—"The Influence of Stress and Strain on the Action of Physical Forces," by Mr. H. Tomlinson,—and "The Metamorphosis of Lucifer; a Study in Morphology," by Mr. W. K. Brooks.

GEOLOGICAL SOCIETY.

April 27.—R. Etheridge, Esq., President, in the chair.—Messrs. S. G. Kirchhoffer, A. H. S. Lucas, and F. T. N. Spratt were elected Fellows.—The following communications were read; "On the Precise Mode of Accumulation and Derivation of the Moel Tryfan Shelly Deposits; on the Discovery of similar High-Level Deposits along the Eastern Slopes of the Welsh Mountains; and on the Existence of Drift-zones showing probable Variations in the Rate of Submergence," by Mr. D. Mackintosh,—"On the Correlation of the Upper Jurassic Rocks of England with those of the Continent, Part I. The Paris Basin," by the Rev. J. F. Blake,—and "On Fossil Chilostomatous Bryozoa from the Yarra-Yarra, Victoria, Australia," by Mr. A. W. Waters.

ASIATIC SOCIETY.

April 25.—R. N. Cust. Esq., in the chair.—Mrs. Chambers, the Rev. B. H. Wortham, and Major-General Sir M. Biddulph were elected Members,—The Rev. S. W. Koelle read a paper entitled "Tartar or Turk," in the first portion of which he discussed the question whether "Tartar" or "Tátár" was the correct and original spelling of this word, and brought forward a considerable amount of evidence in favour of the first form, its meaning being that of "wanderer," "nomad," &c. The second form, he suggested, was probably due to Arab influence which had also changed "Mongol" into "Mogol." The two names, Tartar and Turk, he held to be linguistically of common origin, and appellations merely, rather than the proper names of distinct tribes.

SOCIETY OF ANTIQUARIES.

April 28.—E. Freshfield, Esq., V. P., in the chair.—Mr. C. R. B. King exhibited two fragments of a stone moulding of the fourteenth century, wnich were supposed to have come from the ruins of the Painted Chamber after the fire. The design of the guesso ornaments, with their colours, gilding, and decoration, could still be made out.—Mr. J. H. Cooke communicated an account of an ancient cemetery at Ryham Field, near Berkeley. It seemed to belong to the Romano-British period, and Mr. Cooke quoted some particulars, concerning it from one of the Berkeley manuscripts, viz., the "Description of the Hundred of Berkeley," written by John Smyth, A.D. 1618 to 1639. Mr. E. L. Brock read a paper on recent discoveries of Roman remains in Leadenhall Market. Mr. Brock believed these excavations to have revealed the existence of a considerable Roman basilica; he was also of opinion that the discovery of this building must make us extend the limits of the ancient Roman city.

ROYAL SOCIETY OF LITERATURE.

April 27.—Anniversary Meeting.—Sir P. de Colquhoun, V.P., in the chair.—The following gentlemen were elected the Officers and Council : President, H.R.H. Prince Leopold; Vice-Presidents, The Duke of Devonshire, Very Rev. the Dean of Westminster, Major-Gen. Sir H. C. Rawlinson, Sir P. de Colquhoun, Sir C. Nicholson, General Sir C. Dickson, Rev. C. Babington, C. Clark (Treasurer), C. M. Ingleby, and C. T. Newton; Council, P. W. Ames, W. de Gray Birch (Hon. Librarian), C. H. E. Carmichael, W. H. Garrett, T. R. Gill, C. Goolden (Foreign Secretary), J. Haynes, Major Heales, E. G. Highton, R. B. Holt, W Knighton, C. H. Long, G. W. Moon, Capt. Raikes, H. W. Willoughby, and W. S. W. Vaux (Secretary).

MICROSCOPICAL SOCIETY.

Apbil 13.—Prof. P. M. Duncan, President, in the chair.—A paper by Messrs. W. H. Shrubsole and F. Kitton, on the diatoms discovered by the former in the London clay, was read; also one by Dr. Anthony, "On Sliding Stage Diaphragms."—The other subjects discussed were E. Hallier's view of the cause of the movements of diatoms, the "Society" standard screw, Amphipleura pellucida illuminated by the vertical illnminator, and the structure of wood sections exhibited by Mr. Stewart.—Mr. Powell exhibited an oil-immersion one-eighth-inch objective of the exceptionally large aperture of 1·47 N.A. (1·0=180° in air).

ROYAL INSTITUTION.

May 2.—Annual Meeting.—W. Bowman, Esq., V.P., in the chair.—The annual report of the Visitors for 1880 was read.—The following gentlemen were elected as officers for the ensuing year: President, The Duke of Northumberland; Treasurer, G. Busk; Secretary, Warren De La Rue; Managers, G. Berkley, W. Bowman, T. Boycott, F. J. Bramwell, E. Frankland, C. H. Hawkins, Sir J. Hooker, W. Huggins, W. Watkiss Lloyd, Sir J. Lnbbock, Sir F. Pollock, H. Pollock, Lord A. Russell, C. W. Siemens, and W. Spottiswoode: Visitors, G. B. Buckton, S. Busk, Lord Brabazon, H. H. S. Croft, T. A. De La Rue, J. N. Douglass, Lord Claud Hamilton, A. J. Ellis, R. Mann, W. H. Michael, H. W. Muller, Sir T. Pycroft, L. M. Rate, Hon. R. Russell, and E. Woods.

SOCIETY OF BIBLICAL ARCHÆOLOGY.

May 3.—Dr. S. Birch, President, in the chair.—The President announced that, thanks to a correspondent, he was able to make some remarks on the newly discovered pyramids of Sakkara.—A communication from Mr. Ernest de Bunsen, "On the Date of Menes and the Date of Buddha," was read,—The second paper was from Prof, A. Eisenlohr, "On an Egyptian Historical Monument."—Prof. W. Wright communicated some notes on some copies of Phœnician inscriptions recently sent from Cyprus.

ANTHROPOLOGICAL INSTITUTE.

April 26.—Prof. W. H. Flowers, V. P., in the chair.—Mr. J. E. Price exhibited a collection of bones of man and other animals discovered by himself and Mr. H. Price at the Roman villa at Brading, Isle of Wight. The bones had been examined by Prof. Flower, who reported that they were all in much the same state of preservation, and probably all contemporaneous. They consisted of—1. Man: fragments, probably, of one and the same skeleton; from the condition of the bones it is certain that the individual was adult, and probably of middle age and about the average stature. 2. Dog: numerous remains of at least three individuals, all of nearly the same age and size, not more than half grown, having only the milk teeth in place. 3. Ox, young. 4. Horse, one incisor tooth.—Mr. A, L, Lewis read a paper "On some Archaic Structures in Somersetshire and Dorsetshire,"The author, in speaking of the great stone circles at Stanton Drew, near Bristol, mentioned the elaborate astronomical theories which had been propounded concerning them by antiquaries of the last century, and said that while he had no belief in them, he though that the larger stone circles, of which this group was a specimen, had been used as places for solar worship; there was in nearly all of them some special reference to the north-east, the quarter in which the sun rose on the longest day; in some, however, there were outlying stones towards the south, and this was the case at a circle at Gorwell, in Dorsetshire. These stones, whether to the south or the north-east, were evidently so placed for some special object, as the number of instances in which they occurred was too great for their position to be merely accidental. The paper was illustrated by the exhibition of plan, model, and some worked flints, &c., found by the author at some of the monuments mentioned by him.—Mr. G. M. Atkinson read a paper "On a New Instrument for Determining the Facial Angle."—The Rev, W. S. Caiger read a paper "On Thomas of Aquinum and Apthropology."

SOCIETY FOR THE PROMOTION OF HELLENIC STUDIES.

April 21.—Prof. C. T. Newton, V.P., in the chair.—The Chairman read a paper on the statuette of Pallas recently found at Athens, describing it minutely, and stating that it is undoubtedly a rude copy of the famous chryselephantine statue of Phidias. When discovered it bore many traces of colour. The arm which carries the figure of Victory is supported by a column. This possibly did not exist in the original statue, which from its composite structure might have allowed some hidden means of support in the form of a metal bar. The discovery is of importance as throwing light on the relative proportions of gold and ivory in the original. The Chairman added that he had lately seen a small bronze figure at Turin which corresponded entirely with the known representations of the Phidian statue, and which he was convinced was a free copy. This figure has apparently escaped notice.—Prof. Gardner read a paper by Canon Greenwell, "On Votive Helmets and Spearheads." The writer, after describing various votive helmets and spearheads found at Olympia and elsewhere, and discussing the probable date of the introduction of iron into Hellas, which he placed not long after the time of Homer, proceeded to describe a particular bonze spearhead now in the possession of the Bishop of Lincoln. This, from its close resemblance to those found recently at Olympia, Canon Greenwell thought must also have come from that place. It bears the inscription *θέοδορος ἀνεθεκε βασιλεΐ* and was probably an offering made to the Olympian Zeus about the middle of the fifth century B.C.—After some discussion, in which the Chairman and Messrs. Cust, Gardner, and Pollock took part, Prof. Gardner read a paper "On Boat-Races among the Greeks." Though the existence of these has not hitherto been recognised, the writer thought there was evidence for them both in ancient literature and espcially on coins. He mentioned Corfu as a place where from Phæacian days onwards there seemed traces of such contests, thought it probable that they were a feature in the Isthmian Games, and dwelt especially on the festival instituted by Augustus at Actium and Virgil's well-known description of a galley race, which can hardly have been drawn purely from imagination, and yet cannot refer to any Roman practice.—The Chairman pointed out that the existence of a land-locked basin at Corfu, between the harbour and the rocky island which is commonly known as the Ship of Odysseus, seemed favourable to the establishment of boat-races, and threw out the suggestion that Catullus's famous poem, "Phaselusille," &c., might be a translation from a Greek epigram in honour of some ship that had won a race.

PATENTS FOR INVENTION BILL.

Mr. **Anderson**, in moving in the House of Commons the second reading of this Bill, said that he had been charged with having regard only to the interests of inventors and not to the good of the public. But in his view, there was no conflict of interest in the matter, the good of the public and the profit of inventors ran on parallel lines. Nothing could be more detrimental to the general welfare than the system of repression of the inventive talents of the people which had been established in this country. It had a tendency to drive inventors to other fields. The argument that an inventor ought to pay for the privilege of a patent was plausible, but insufficient. It was no argument in favour of heavy taxation, nor was there any force in the objection to the Bill that the taxation on patents weeded out useless patents. A much lower tax than the present one would be adequate for that purpose. The result of such a system had proved disastrous in many instances. As instances, he would adduce the refusal of Prussia to grant a patent to the Bessemer process, and that of Germany to the Siemens process. The real process of weeding out useless inventions was performed by the public, who would not buy them. In America they acted on the principle that the Patent Office should not do much more than pay its own expenses. There the charge for a patent of seventeen years was only a small fraction of the charge made in this country for a fourteen years' patent. It must also be borne in mind that the subject of a patent was usually some small labour-saving appliance. In America there were about 15,000 patented inventions each year. In Great Britain only 3,300. The Patent Office at Washington was one of the finest public buildings in the city, in striking contrast to the miserable structure in Chancery-lane. From America had come some of our most useful recent inventions—*e.g.*, sewing machines, knitting and type-setting machines, the electric light, the telephone, the microphone. Yet in America the raw material and labour were much higher than in this country. He would give the first charge for inventors' patents in six of the great nations of the world:—In Germany it was £1 10s.; in Austria, £10; in France, £4; in Belgium, 8s.; in the United States, £7; in England, £25. After the third year the payments in the several countries were as follows:—In Germany, £16 10s.; in Austria, £10; in France, £16; in Belgium, £1; in the United States, £7; and in Great Britain, £75. It would be seen from the figures he had quoted that inventive genius was not encouraged in this country as it deserved to be. He now proposed to mention the leading principles contained in the Bill. It provided for the appointment of paid commissioners, whose business it would be to control the work of the Patent Office in the place of the law officers of the Crown. It proposed that the period of the duration of patents should be extended from fourteen years to 21. It was true that it was possible now for an inventor to obtain an extension of his patent beyond the term of 14 years, but the process by which this could be done was extremely difficult and expensive. The next principle in the Bill provided for the extension of the benefit of any changes that might be made in the terms under which new patents could be obtained to all patents already existing. The next important point was that there should be some term of grace allowed in the case of periodic payments. At present, if an investor failed through forgetfulness to make the payment on the very day when it was due, he lost all his right in connection with the patent. He knew a case in which £6,000 had been spent on an investment, and in which the benefits of the patent were lost to the inventor through the neglect of his agent to tell him when the periodic payment was due and his consequent default. What he proposed was that a patentee should have a whole year of grace, but that failure to pay at the appointed time should be punished by the infliction of fines graduated in amount according to the length of the patentee's delay in fulfilling his monetary obligation. The chief principle in the Bill related to the reduction of fees. The reduction proposed in the measure was, however, only a tentative reduction. The great object he had in view was to lighten the payments in the earlier stages of the transaction, so that a patentee should have time to develop his invention before having to pay large sums of money for the privileges granted to him. He held that there ought to be no payment beyond the initial payment until after the lapse of six or seven years. Among the remaining provisions of the Bill was one by which he proposed to extend the period of provisional protection from six months to one year, and to make the date of the patent ultimately depend upon the date of the application. The sealing of the patent, he maintained, ought to date back to the original application, in order that the first applicant might be sure of enjoying the benefit of his invention. The Bill also laid down the principles that improvements in patented inventions should be charged for at lower rates than at present, and that servants of the Crown should be allowed to have patents provided they were not actually in the Patent Office. In cases in which the use of an invention should be reserved to the Crown, he proposed that the question of the remuneration to be given to the patentee should be determined by arbitration. In conclusion, he said he should be glad to see the question taken up by the Government if they would deal with it in a really liberal spirit. It was a question which should command the most earnest attention of Her Majesty's Ministers and the House, for it was of the utmost importance that the inventive genius of this country should be encouraged without stint in order that we might maintain a high position among the nations of the world. He begged to move that the Bill be now read a second time.

Mr. **Dillwyn** urged the Government to oppose the measure. His objection to it was that it was an inventors' Bill only, and did not sufficiently safeguard the interests of the public. The provision which chiefly challenged opposition was the proposal to give all inventors a monopoly of their inventions for 21 years. The public, he maintained, ought not to be excluded for so long a period from the benefit of an invention for which they had to pay. Twenty-one years ought not to be the normal time for which patents would be granted. In the majority of cases, the cost of invention being very little, it would not be fair to the public to grant a monopoly for more than fourteen years. He was willing to extend the period to 21 years in the case of inventions on which much capital should have been spent, or in which great difficulties should have been experienced, but such an extension of time ought to be the exception, and not the rule. He quite agreed that the fees exacted from inventors might be lowered advantageously, and that a change in the administration of the Patent Office might have good results, but he was so averse from the proposal to give inventors a monopoly for 21 years, that he felt constrained to move that the Bill be read a second time that day six months.

Mr. **Chamberlain** said he was very sensible of the importance of the question dealt with by the hon. member. Every one representing a large manufacturing community must know how keenly the hardships inflicted by the existing law were felt by inventors—(Hear, hear). A few years ago there existed a strong feeling altogether antagonistic to patents, the feeling manifesting itself not only among theorists and political economists, but also among manufacturers themselves. He was inclined to believe that the chief objections to the Patent Law were two. In the first place the monopoly rights afforded by patents were not really enjoyed by the inventors themselves, but by middlemen. That this was so was in part the consequence of the greatest defect of the existing law—namely, the exaction of excessive fees—(hear, hear)—especially those charged in the initiatory steps for taking out the patent. The fees were so high that a poor man was almost compelled to have recourse to the resources of the capitalist, who, of course, expected to derive some benefit from the transaction. His second objection to the present law was a still more serious one. It was that the progress of invention was to a large extent retarded by the existence of previous obstructive or frivolous inventions. There were three objects desired by those who had in view the reform of the law. They wished, first, that the inventor should receive fair remuneration. Secondly, they desired to stimulate invention. Here he might incidentally observe that if there were no Patent Law, one result would be that inventions would be sold to the great great disadvantage of the public, and another that capital would not be invested in the production of inventions. The third object they had in view was so to carry out the two purposes which he had already mentioned as not to restrict the further progress of invention by an undue prolongation of monopoly rights. They would have, therefore, to consider the term for which a monopoly ought to be protected, and the amount of fees which ought to be paid. The length of the term was, of course, a purely arbitrary matter, and the only question to decide at present was whether a sufficient case of hardship could be made out to justify an extension of the existing period. The opinion of the Commission in 1865 was that the term of fourteen years should not be extended. In foreign countries, the terms for which patents were granted varied very much. In France they were granted for fifteen years; in Germany for fifteen years; in Russia for three, five, or ten years; in Italy for one to fifteen years; in Spain for five, ten, or twenty years; in Austria for one to fifteen years, and in the United States for seventeen years. It would be found that the term now allowed to English patentees was at least as favourable as the average term allowed in foreign countries. His own opinion, after taking into consideration the fact that when it was proved that a patentee had not received sufficient for his invention, he could obtain further reward, was that the term of fourteen years was a fair concession on the part of the public in return for the benefit conferred upon it by the patentees. Coming next to the question of fees, he asked whether these fees really did discourage invention. The facts hardly seemed to bear out the theory that they did so. The applications for patents had steadily increased in recent years, and had risen from 1,211 in 1852 to 6,000 in 1880. It was said that the number of American patents was much larger, and it was no doubt true that the applications for American patents were something like 50,000 annually at the present time. The cost of an American patent was £7, but this amount was largely increased if the patent were opposed either by the examiners or by third parties. In the United States, a preliminary examination was established, which raised the question of novelty, and which led to a great number of questions, which were not raised in the case of similar patents in this country. When the member for Glasgow said that, in consequence of the differences in the patent laws, the Americans were beating us hollow in inventions, he must state his opinion that his hon friend was utterly wrong. He knew indeed that that was the prevailing impression, but he did not believe it was based on adequate foundation. Owing probably to the scarcity of labour in the United States, the Americans had a multitude of inventions in matters which in this country were considered too trifling for the exercise of ingenuity, but it would be found that the vast majority of the really important inventions by which the trade and commerce of the world had been revolutionised, were English inventions. He need only mention the invention of men like Stephenson, Watt, Wheatstone, Bessemer, and Siemens. In fact nine-tenths of the important inventions in the great trades were the products of English ingenuity—(Hear, hear). This circumstance should be borne in mind, when it was supposed that we were beaten hollow by our cousins across the water. At the same time, he did not urge these considerations in order to diminish the force of the facts stated and the arguments put forward by his hon. friend in favour of a liberal reduction of the fees. Putting aside exaggeration they must all be of opinion that the cost, and especially the initial cost, must have a tendency to disparage invention. Under these circumstances, the first point in any reform was to lessen most substantially the initial fee at all events, and possibly the subsequent fees too. He likewise agreed with his hon. friend that it would be desirable to extend the term of provisional protection, and to allow greater facilities for the amendment of the specification. He was informed that if the reduction which his hon. friend suggested were adopted as it stood in the schedule to the Bill, the fees would not pay the actual cost of working the Patent Office, unless indeed, there should be immediately a very large increase in the number of applications—(Hear, hear). He did not pledge himself to this opinion, but it was the opinion of the officials in the Patent Office. At all events, he agreed with the principle laid down by his hon. friend, that in making the reduction regard should be had only to the necessity of paying the actual expenses of the office. His hon. friend proposed also to alter the term for the subsequent payments. He found that the effect of those large subsequent payments was very remarkable indeed. Between the time of the application for a patent and the sealing one-third of the applications dropped, either because the inventor was unable to pay the fees, or because in the interval he had discovered that the patent was of no value. In the third year there came a second payment of £50, and the result of that was that two-thirds of the remaining patents dropped off, and only 30 per cent. went on to the term of the next payment at the end of the seventh year. That knocked off 19 per cent., leaving only 11 per cent. of the total number of sealed applications, which were carried forward beyond the seventh year. His hon. friend complained of the largeness of these payments, but every practical man knew that it had a beneficial effect in weeding out frivolous patents, which were a great clog to subsequent inventions—(Hear, hear). He did not like, therefore, to give up the idea of having some heavy second and tertiary payments which might have the effect of weeding out such patents. His hon. friend asserted, indeed, that there was a self-weeding process going on which would do all that was required, but for his own part he did not believe this to be the case. Still he was inclined to agree with his hon. friend that the third year was too early to make the second large payment. Without pronouncing positively on the subject, he thought that that payment might fairly be postponed to the fifth year. Then his hon. friend proposed that a year of grace should be allowed for the first and all subsequent payments. That, he thought, was open to serious objection, although he did not pronounce positively on the subject; for the effect of all periods of grace was that they became part of the original term—(Hear). His hon. friend further proposed that the sealing of a patent should date back to the original application. That he thought was an exceedingly reasonable proposal, and one which would have the support of the House, for no doubt great injustice occasionally followed from the present system. Then his hon. friend proposed that paid commissioners should be appointed to do the work which was now done by the law officers of the Crown; he thought, however, that before we created a new official post we ought to consider what it would have to do. If it were to do no more than the duties at present imposed upon the law officers of the Crown, he thought a change was unnecessary. He knew it had been suggested that there should be a preliminary inquiry into patents, but he thought that the decisions of any tribunal appointed to deal with such delicate matters would give rise to the greatest dissatisfaction. At all events his hon. friend made no such proposition in the present Bill, for he did not propose to lay on the commissioners any new duty. His hon. friend suggested that they should keep a library, and records, and a register, and that the register should be indexed and accessible to the public on payment of a small fee. During the last few years all legitimate cause of complaint on this head had been satisfactorily removed. At the present time there existed a complete register of all patents from the year 1617 downwards; it was indexed to facilitate searches, and it was accessible on payment of a fee of one shilling. These registers had been in existence since 1852. There were alphabetical and subject indexes, which were published annually and sold to the public at cost price. Lastly, there were volumes of abridgments of the specifications of patents most convenient for reference. These had already been published in 98 series. At the present moment fourteen clerks were engaged upon them, and he believed that in a very short time they would be complete. His thanks were due to his hon. friend for calling attention to this important subject and to the scheme he had prepared for the consideration of the House. He might assume that his hon. friend's chief object was to have his proposals fully discussed, for he could hardly suppose that in the present session he would be able to carry the Bill to a successful issue. This was a work which the Government ought to undertake—(Hear, hear). He was aware that there were many points of detail not touched upon by his hon. friend's Bill, to which the Government would have to give attention in amending the patent laws. It would also be necessary to take into consideration the possibility of international arrangements—(Hear, hear). He thought he had shown that he was friendly not only to the objects his hon. friend had in view, but also to what he conceived to be the principal proposal contained in the Bill—viz., a substantial reduction in the fees and the prolongation of the term of provisional protection. He was not in a position to pledge the Government as to the course which in a future session they might be prepared to take. Nothing would please him better than to find that, the House, having resumed control over its proceedings—(hear, hear)—and being able to deal with the general business of the country, he should have an opportunity of making alternative proposals in the sense, to a large extent, of those made by his hon. friend. All he could assure him was that he should be anxious to deal with the matter at the earliest possible moment. In conclusion, he hoped his hon. friend would be satisfied with this assurance and with the discussion which had arisen, and that he would not put the House to the trouble of going to a division—(Hear, hear).

Mr. Gregory remarked that the law officers of the Crown were continually changing, that they were not scientific men, and that they could not be acquainted with the nature of the schemes which were submitted to them. The consequence was that a number of patents passed which did not possess the element of novelty, besides a great many more which did not possess the element of utility. In creating these patents we were giving individuals a monopoly against all the world, and such a right ought not to be granted without stringent conditions being imposed. One of the conditions ought to be that any one should be allowed the use of the patents on fair and legitimate terms—(Hear, hear). He hoped the President of the Board of Trade would, after consideration of the subject, see his way to the appointment of some sort of tribunal to regulate the issuing of patents in the first instance. The fees should certainly be reduced, but, at the same time, we ought to provide against the reduction of expense leading to a flood of patents which were neither useful to the public nor to the persons who sought to obtain them—(Hear, hear).

Mr. Broadhurst said the working men of the United Kingdom were unanimously in favour of a reform quite as large as the scheme proposed in this Bill. Many of them were of opinion that the Bill did not go far enough in the direction of reducing the fees, and that in justice to the inventor as well as in the interests of the nation the cost of a patent should be reduced, at least, to the sum the American Government were charging. It was quite true, as the President of the Board of Trade had observed, that in America, in addition to the £7, there were charges made by the examiners for contentions with the inventor as to whether his invention was original or not. Still, the great advantage of the American system was that when the contention was over and the comparatively small additional charges were paid the inventor had a protection when he left that office, whereas when he left our office he had a patent, but no protection. He would appeal to the Government to take up this question at the earliest possible moment. He confessed he was not so well pleased with the statement of the President of the Board of Trade as he had expected to be. The right hon. gentleman's promises were not at all liberal, and were in no way equal to the occasion. He should prefer to wait rather than have a Bill which, according to the right hon. gentleman's statement, would be the least possible reform that could be given by the Government in response to the working people and the inventors of this country. If the hon. member for Glasgow went to a division he should support the second reading of the Bill.

Mr. Stuart-Wortley thought it could not be denied that inventions fell within that class of matters which were rightly the subject of monopolies. They were told that the patentee was apt to require too much profit. That was a matter which might safely be left to the laws of supply and demand—(Hear, hear). If the patentee were to require more than the public were willing to give he would soon find that he could not obtain it. He did not agree with the President of the Board of Trade that if this question were to be dealt with it should be dealt with only by the Government. What had happened that day showed that the question might be very well discussed on a Wednesday afternoon, and upon a Bill brought forward by a private member. As to loss to the revenue from the reduction of patent fees, the experience of America, and our own experience with respect to the penny post, were sufficient answer to such pessimist views—(Hear, hear). Whether a Bill was to be introduced by the Government or not, he hoped the question would be dealt with at as early a date as possible. If the hon. member for Glasgow went to a division he would support him, not because he adopted in their entirety the provisions of the measure, but to record his sense of the importance of the subject—(Hear, hear).

Mr. Carbutt supported the Bill. He believed the general feeling of the country was in favour of a Board of Examiners; but he would give them the power only to advise as to whether an invention had been patented before or not, but not the power to forbid its being patented. If they were to have a new patent law they ought to have a new Examining Board. In this country we had only one patent a year for 12,000 of the population, while in America the proportion was one patent to 3,000 of the population. If we could get an open patent law our work-people would see it to be their interest to spend their spare time in improving the machines upon which they worked, and thus the cost of production would be reduced. His principal objection to the Bill was that it proposed to extend the time to 21 years. If they were to do that they would set public feeling against them, and the result would be that the patent laws would be swept away. He hoped his hon. friend would go to a division, that the Government would accept the Bill as a platform to start from, and that they would be educated up to the requirements of the country on the subject—(Hear, hear).

Sir H. **Holland** said that, speaking in the presence of the two law officers of the Crown, he must observe that the present investigation of patents was not altogether satisfactory. That was not the fault of the law officers or their predecessors; but law officers were a shifting body and were not necessarily scientific men. The House ought to press on the Government the necessity for an Examining Board. The Bill proposed that there should be three Commissioners, which was a distinct improvement on the present system, because if a patent were to pass a competent examining body, it would prevent litigation, whereas at present it was hardly possible for a working man to fight in the law courts men of capital who were infringing his rights. However, he would prefer the American system. He was of opinion that he should have a Board, not of three but of five commissioners, qualified to examine inventions, and that their certificate should give validity to a patent in a court of law—(Hear). They should also have the power of saying, "We are not satisfied that your invention is so new or good as to deserve a certificate, but you may take out a patent at your own risk." With regard to fees, the only thing that should be aimed at was that they should be sufficient to pay the expenses of the office. If we were able substantially to reduce the fees we should prevent the transmission of inventions to America with the view of taking out patents there, and in that way would benefit this country and our own inventors. As to the question of time, on that point he was at issue with the hon. member for Glasgow. However, he heartily supported the Bill, and would go into the lobby with the hon. member if he divided—(Hear).

Mr. A. **Brown** said that the American system appeared to be preferred by most members who had spoken. Under that system they had a competent commission for examining inventions, and deciding whether they were fit subjects for patents. If, in their opinion, the invention was not a fit subject, a patent might be granted with an endorsement that the commissioners were not able to grant a full certificate. The result was that they had on the one hand a clean certificate, and on the other a certificate with an endorsement to show that there was something behind. He would not support the Bill if he thought it entirely an inventors' question; but the reform of the Patent Laws was a question of public importance. It was a national question that we should have cheap patents, because by such patents we should promote the invention of labour-saving machinery and thus improve the manufacturing power of the country. The President of the Board of Trade had quoted the report of the Royal Commission which sat 20 years ago, but he did not quote the report of the Committee which sat since that time and showed that a great change in public opinion had taken place. He referred to the report of the Committee over which his hon. friend the member for Banbury (Mr. Samuelson) presided), and since then the feeling in favour of a good Patent Law had grown stronger. The Committee reported "that the privilege conferred by letters patent promotes the progress of manufactures, by causing many important inventions to be introduced and developed more rapidly than would otherwise be the case." The fees charged on patents went far to prevent the introduction of labour-saving machines into this country. America was largely competing with us in this direction. In the matter of pianos, for instance, 21 patents were taken out, the cost of which in America amounted to £147; whereas the cost in this country would have been no less than £3,765. So that our manufacturers were heavily handicapped by the very large fees for protecting inventors' rights. The American Patent Commissioner said,—

"The records of this office, as well as the history of manufactures, show the immense labours and achievements of inventors during the last half-century, but the end in no department is yet reached, the fields of invention are exhaustless, and under protection wisely given the future will be richer in invention than the past."

Again, in his report for 1879, the American Patent Commissioner says:—

"The constitutional provision which confers upon Congress power to promote the progress of science and useful arts by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries evidently imports, not that inventors are hateful monopolists to be taxed by the Government, but that they are public benefactors to be encouraged and rewarded. That this is the true theory the experience of our people with their patent system during the past century abundantly proves."

The well known paper, the *Scientific American*, says:—

"In the United States the main idea is that the inventor of any new and useful device is conferring a benefit upon the nation, and should, therefore, be protected in his invention. This is the correct theory, because it has succeeded in producing such astonishing results that other nations are gradually adopting it."

Innumerable extracts to the same effect might be given from the leading scientific papers of America. The majority of our inventors were mechanics, whose daily occupation was with machinery and mechanical processes of every description, and who, therefore, had the greatest opportunities of seeing defects and thinking out improvements; they wanted only the incentive to produce innumerable improvements. The specialty of American invention was labour-saving tools, and it was chiefly by means of the excellence and economy of their labour-saving tools that the Americans were able to successfully compete with us. The whole power of America to compete with us in the production of many of their manufactures arose from the use of labour-saving machinery. Workmen were encouraged to perfect the machinery with which they worked, and if we would compete with America we must greatly reduce our fees, extend the period of protection, and give greater security to our inventors. The result often depended, not on large and important inventions, but on improvements in small details in the machines used by the workmen employed on manufactures. In this way labour-saving machinery had been given to the world. He laid great stress, therefore, on that portion of this Bill which proposed to reduce the fees on patents. That was the first step in the right direction. He also approved the extension of time to be given to patents to 21 years. It was often years before a patent could get fairly into operation, and 14 years did not, he thought, provide an adequate reward. The proposed extension would not only be a boon to the inventor, but by stimulating invention, would prove most advantageous to the industry of the country. He hoped his hon. friend would take the sense of the House on the second reading of his Bill.

Mr. **Jackson** did not regard this as a mere inventors' Bill; the question which the House had to consider was as to the advantage of inventions to the industry of the country at large. The benefit of inventions was much greater to the country than to the inventor himself. The Chamber of Commerce in the town he had the honour to represent and other Chambers of Commerce had fully discussed the question, and had, over and over again, petitioned for the reform of the Patent Laws. He therefore hoped the hon. member for Glasgow would go to a division on his Bill.

Mr. H. **Palmer**, as a member of the Committee which sat in 1871 and 1872, had listened to a large portion of the speech of the right hon. gentlemen the President of the Board of Trade with great satisfaction; but there was one part of it in which he could not agree—where he referred to the constitution of a better body of Commissioners. It was impossible for his learned friends the Attorney-General and Solicitor-General, with their other laborious duties, to deal satisfactorily with applications for patents. The Committee had therefore recommended that the Commission should be reinforced by the appointment of competent persons having practical skill as well as scientific and technical knowledge, whose time was not too much engrossed by other employments to conduct the preliminary examination which ought to precede the grant of patents. The appointment of such a Commission would, he thought, be of very great importance. It was intended by the late Government to appoint additional Commissioners. The Lord Chancellor, the Master of the Rolls, and the two law officers were now the only Commissioners. From their numerous engagements it was very difficult to get a meeting of the Commissioners, and a great deal was left to the Master of the Rolls. He thought the hon. member for Glasgow would be justified in taking a division on the second reading if it were not assented to by the Government. The extension of the term might very well be left to be dealt with in Committee.

The **Solicitor-General**—A good deal had been said about a new Commission for examining into each case before patents were granted. That was one question. Whether that was the best body for doing what should be done was quite another. His right hon. friend the President of the Board of Trade did not differ as to this—that, if a preliminary inquiry should take place as to the novelty of the invention claimed, it would be impossible that it should be carried out by the present Commission. But what he called attention to was that this Bill did not deal with that point—it merely transferred precisely the same duties and very limited powers of the present Commissioners. The powers of the law officers appeared much greater than they really were. They had no power to refuse a patent, however old the alleged invention might be. Their powers were extremely limited, and his right hon. friend had merely stated that a new commission with such limited powers would be of no great advantage to the public. Whether or not it would be desirable to have a more extensive preliminary investigation was quite a different matter, on which he expressed no opinion.

Mr. J. **Howard** thought great danger must arise to our manufacturing system if we neglected to reform our patent laws. He had some experience on this subject, having taken out three or four patents in England. The preliminary examination was totally inadequate. The American system was greatly superior. He visited the great museum in Washington. He met an examiner having his specification in hand. The examiner took him round the museum, where all the models were arranged, showing him where he had been anticipated by previous inventors. The result was that two heads of the specification were struck out, and a patent was granted for three others. In this country a patent might be granted a dozen times over. There was a necessity for a thorough reform in this matter. This Bill was entirely in the right direction, but it merely touched the fringe of the question. There was one expression which fell from the President of the Board of Trade which rather grated on his ear. He spoke of property in ideas. That expression had wrought great mischief in this country. No inventor had any property in ideas any more than an author. An inventor had no property in his invention until he had made that invention public, and therefore there could be no property in a mere idea. It was an abuse of terms to regard an inventor as a monopolist, because he took nothing whatever from the public. But even if there were any truth in the suggestion that an inventor was a monopolist, the proper remedy would be to adopt the system of compulsory licences. The American system of patents was infinitely superior to that of this country, inasmuch as it enabled patents to be taken out cheaply for small improvements. He hoped that the hon. member's Bill would be read a second time unanimously by the House—(Hear, hear).

Sir G. Balfour complained of the meagre character of the Patent Office reports, which were published annually.

Mr. Ecroyd thought that the House was indebted to the hon. member for Glasgow for having brought under their notice a subject of so much importance to the country—(Hear, hear). He thought that the time during which patents should continue in force should be extended, and that much larger powers should be conferred upon the Commissioners proposed to be appointed by this Bill, so as to enable them to winnow out the real from the unreal patents—(Hear, hear). Great inventors were often most justly rewarded under the present system, though often a working man received far less than was his due under it, owing to the enormous legal expenses he had often to incur in defending his rights as an inventor. The great number of unreal inventions stood in the way of slight though important improvements in machinery. It should be the endeavour of the House to reduce to the lowest possible amount the cost of obtaining patents for genuine inventions, and at the same time to enable the Commissioners to sweep aside all inventions that were not substantial—(Hear, hear). If these objects could be obtained, an immense boon would be conferred, not only upon the working man, but upon the country generally. He wished to acknowledge the ready co-operation which manufacturers continually received from their working men in the way of carrying out small improvements in their machinery. He should be glad if, in view of the objections to the Bill he had pointed out, the hon. member for Glasgow would not take the sense of the House upon his measure, but would be content with having elicited a strong expression of opinion in favour of Patent Law reform.

Mr. Barran said that this was a question which affected equally both inventors and the public, and that the effect of any measure of Patent Law reform would be more for the benefit of the country at large than of the individal inventor. He trusted that if the right hon. gentleman the President of the Board of Trade took up this matter on a future occasion he would deal with it in a broad and a comprehensive spirit. If they were to go on merely tinkering the law year after year, they could not expect to obtain a satisfactory result or to meet the requirements of the trade of the country. The large inventors of the past had perhaps been able to reap the reward of their skill and industry, but the working man who had been the means of acquiring the wealth of the country had been precluded from obtaining just remuneration for his inventions in consequence of the great expense of obtaining a patent. The system of cheap patents which prevailed in America had stimulated exertion and ingenuity in that country, and the stimulant had had a beneficial effect over the whole population of that country. The way in which the American inventor obtained benefit from his patent was by selling a large number of the patent articles at a low rate, instead of charging a high price for a few, which was the custom adopted in this country. If facilities could be given for securing rights in inventions at a cheap rate much benefit would result to the community. If a working man employed in large works felt that he could, at a small cost, secure the benefit of his invention, ingenuity would be greatly stimulated, and in such circumstances there need be no fear of monopoly. The whole country was now looking forward to a reform in the patent law, and the feeling throughout the large borough he represented was that some step in this direction should be taken as speedily as possible.

Mr. D. Grant observed that the foundation of the great success of the American nation was the use by them of labour-saving apparatus, which was the outcome of a number of small inventions. If we were to win in the great race we were entering upon we must remove the present tax upon invention.

Dr. Playfair remarked that he had the great disadvantage of not having been present during the earlier part of the discussion upon this subject, to which he had paid considerable attention, but his duties elsewhere had compelled him to be absent. A few years ago a general feeling appeared to have prevailed against patents, and many of the most influential statesmen in all countries seemed to be opposed to them upon principle. That feeling, however, had undergone a change of late years, and now the view entertained was that patents should be encouraged rather than discouraged. It was, however, generally admitted that our Patent Law was in such an unsatisfactory state that a thorough reform of it had become necessary. (Hear, hear.) When an invention was good the interests of the public and of the inventor in the patent were identical, but when the invention was bad, those interests were opposed. Thus when a short cut was made shortening a common road, it tended to the advantage of everybody, but when the road was strewn with obstacles, the disadvantage was general. The object of this Bill was undoubtedly to enable patents to be more readily and more cheaply obtained, but it must be remembered that merely to cheapen the cost of obtaining patents would be to multiply their number, and thus to throw additional obstacles in the way of good inventions. Inventions were the outcome of general demand, and thus it usually happened that when an invention was required, there were always many persons who were on the point of hitting upon it when it was brought to light, in the same way that when one man pulled the ripe apple, many others might secure fruit which was on the point of ripening. Thus it became a question of some difficulty in many cases to ascertain who was the first discoverer of a particular invention. How were the different claims to priority of invention to be sifted? He should suggest that they should be sifted by a system of examination—(Hear, hear). This Bill, however, provided for no system of examination. Such a system would be good, both for the inventor and for the public, by freeing the way for real inventors to secure the fruits of their discovery. He approved the proposal of the Bill to appoint a Commission, but then adequate powers should be conferred upon the Commissioners to enable them to sift the good from the bad patents and to promote inventions by the establishment of museums and by other means. It was curious how short-lived most patents were, their average duration being only three years and a fraction of a month. It must be remembered that he was not speaking on that occasion as a member of the Government, but was merely expressing his individual views on the question. He confessed that it would be painful for him to vote against the Bill, but, as he did not regard it as efficient, he should recommend the hon. member for Swansea to withdraw his amendment in order to render it unnecessary for the House to divide upon the second reading of the measure, it being understood that at some future period a more comprehensive proposal for the alteration of the Patent Law would be brought forward.

Mr. Dillwyn, in asking leave to withdraw his amendment, explained that he had only moved it with the view of raising a discussion on the question.

Mr. Anderson was glad to find that the House was in favour, if not of his particular Bill, of some very large measure of Patent Law reform. He criticised the speech of the President of the Board of Trade, which he regarded as unsatisfactory, and pressed upon him the necessity for appointing Commissioners other than the Law Officers of the Crown, and for cheapening the cost of patents. Even if his Bill were read a second time, he could not expect that it would become law during the present session.

The amendment was then withdrawn, and the Bill was read a second time.

SMOKE REDUCTION.

The Roman proverb says that the health of the nation is the supreme law. Be that as it may, the advancement of health is not without importance to the Kyrle and National Health Societies, who, we are glad to say, are promoting an exhibition of improved lighting and heating appliances, having for their object the decrease of smoke throughout the kingdom. The exhibition, which will open at South Kensington, London, on 24th October, and close on the 26th November next, will be presided over by H.R.H. Prince Leopold, Duke of Albany, K.G., and the Duke of Westminster, K.G., and will be conducted by an influential Executive Committee, whose proceedings have frequently appeared in the papers. It is evident that a change must take place from the old and barbarous state of things which occasions so much waste and discomfort, and we are pleased to notice that a great number of new patents have been taken out for improvements in the heating and lighting art. The arcades of the Royal Horticultural Society and the adjacent galleries of the Commissioners of 1851 will be devoted to the purposes of the exhibition. A large number of applications for space have been received in advance of the particulars of the exhibition, and intending exhibitors should at once write to G. R. Redgrave, Esq., Works Office, South Kensington Museum, London, as no exhibits can be received after the 30th inst. Prizes in medals and money will be awarded to the inventors of the best appliances for the prevention of smoke from boiler furnaces, domestic grates, and ranges, and to inventors of improved fuel for use in households and manufactories. Professors Abel, Frankland, Dr. Siemens, and other well known men of science are associated with the movement.